

Appl. No. 10/709,552
Amdt. dated March 31, 2006
Reply to Office action of February 07, 2006

REMARKS/ARGUMENTS

1.Rejections of claims 1 and 7 under 35 U.S.C 112:

Response:

Claims 1 and 7 have been amended to overcome this rejection.
5 Specifically, the process steps recited in claims 7 and 11 are numbered by (a)–(d), and no new matter is introduced. Reconsideration of claims 1 and 7 is requested.

2.Rejections of claims 7 under 35 U.S.C. 103(a) as being unpatentable
10 over Lin (US 6,140,224) in view of Huang et al. (US 6,297,065), Kern (Handbook of Semiconductor Wafer Cleaning Technology – Science, Technology, and Applications; 1993; William Andrew Publishing/Noyes.) and Pintchovski et al. (US 4,822,753):

Response:

15 Claim 7 is listed as follows for reference.

Claim 7 A method of forming a barrier layer comprising:

- (a) providing a substrate having at least a conducting layer thereon;
- (b) performing a chemical vapor deposition (CVD) process for forming a Ti/TiN film onto the conducting layer;
- 20 (c) performing an examination procedure, and if particles are detected in the Ti/TiN film, then performing step (d); and
- (d) performing a rework procedure comprising:
 - performing an etching process to remove the Ti/TiN film;
 - scrubbing the substrate with a scrubber machine for removing the
 - 25 particles;
 - rinsing the substrate with a cleaning solution; and
 - performing another CVD process for forming another Ti/TiN film

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onto the conducting layer.

Huang teaches a method for detecting if a metal layer such as Ti/TiN layer is good or not by an examination procedure as the Examiner points out, however, there are still some differences between claim 7 and Huang's method. The applicant explains as follows. Although Huang teaches an examination procedure and a rework process, the metal layer including Ti/TiN layer 309 to be reworked is not disposed inside the via holes. Instead, the Ti/TiN layer 309 is formed over the contact plugs 306 and 308. In addition, the examination procedure of claim 7 is used to detect particles, which deteriorate the electrical performance of the contact plug to be formed. On the hand, Huang's examination procedure is used to detect a complete metal layer 309 in which the particle issue is relatively less important. Accordingly, Huang only detects if the metal layer is good or bad without specifying the particle issue. Thus, the applicant believes the examination procedure of claim 7 is distinct from Huang's teaching, and claim 7 should be allowed. Reconsideration of claim 7 is politely requested. Claims 9-15 are dependent on claim 7, and should be allowed if claim 7 is found allowable.

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3.Allowable subject matter:

Response:

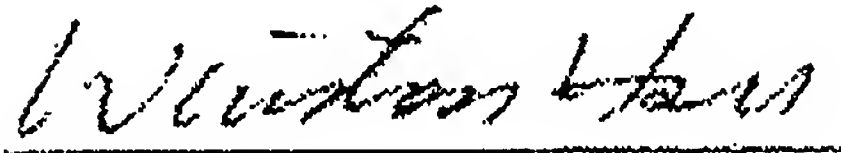
Claim 1 has been amended to overcome the rejection under U.S.C 112, second paragraph, and should be allowed. Claims 5-6 should be allowed once the U.S.C 112 rejection is withdrawn.

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Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

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Sincerely yours,



Date: 03/31/2006

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